AMENDMENTS TO THE CLAIMS

Please cancel claims 1-5, 8-10, 12, 13, 60, 63, and 64.

Please amend the claims as follows:

1. Canceled

2. Canceled

3. Canceled

4. Canceled

5. Canceled

6. (Currently Amended) ~~The nanocomposite resist of Claim 5~~ A nanocomposite resist comprising:

a nanoparticle component; and

a polymer component

wherein the nanoparticle has an average diameter less than about 10 nanometers.

7. (Original) The nanocomposite resist of Claim 6, wherein the nanoparticle has an average diameter less than about 2 nanometers.

8. Canceled

9. Canceled

10. Canceled

11. (Currently Amended) ~~The nanocomposite resist of Claim 9,~~ A nanocomposite resist comprising:

a nanoparticle component; and

a polymer component

wherein the nanoparticle component comprises a polyhedral oligosilsesquioxane and the polymer component comprises poly(α-chloroacrylate-*co*-α-methyl styrene).

12. Canceled

13. Canceled

14. (Currently Amended) A lithographic process comprising:

exposing a lithographic recording medium to radiation to form a pattern; and

developing the pattern;

wherein the lithographic recording medium comprises ~~the~~ a nanocomposite resist ~~of Claim 1~~ comprising a nanoparticle component and a polymer component.

15. (Original) The lithographic process of Claim 14, wherein the nanoparticle component comprises an oxide of silicon, aluminum, titanium, zirconium, iron, antimony, tin, cerium, barium, manganese, vanadium, chromium, lead, copper, indium, yttrium, zinc, mixed oxides thereof, or combinations thereof.

16. (Original) The lithographic process of Claim 14, wherein the nanoparticle component comprises a polyhedral oligosilsesquioxane.

17. (Original) The lithographic process of Claim 14, wherein the polymer component comprises poly(α-chloroacrylate-*co*-α-methyl styrene), poly(2,2,2-trifluoroethyl-α-chloroacrylate), poly(methyl methacrylate), poly(butene sulfone), polysilanes, polyacetals, or combinations thereof.

18. (Original) The lithographic process of Claim 14, wherein the nanocomposite resist comprises poly(α-chloroacrylate-*co*-α-methyl styrene) and the nanoparticle component comprises a polyhedral oligosilsesquioxane.

19. (Original) An integrated circuit prepared by the lithographic process of Claim 14.

20. (Previously Amended) The lithographic process of Claim 14, wherein the radiation comprises an electron beam.

21. (Previously Presented) The lithographic process of Claim 14, wherein the radiation comprises an ion beam.

22. (Currently Amended) A polymeric chemically amplified resist comprising:

a methacrylate component ~~comprising at least one methacrylate-containing comonomer~~; and

a polyhedral oligosilsesquioxane component ~~comprising at least one polyhedral oligosilsesquioxane-containing comonomer~~;

wherein ~~the methacrylate-containing comonomer is different than the polyhedral oligosilsesquioxane-containing comonomer~~ the methacrylate component does not comprise a polyhedral oligosilsesquioxane moiety.

23. (Original) The polymeric chemically amplified resist of Claim 22, wherein the methacrylate component comprises methyl methacrylate, t-butyl methacrylate, methacrylic acid, or combinations thereof.

24. (Original) The polymeric chemically amplified resist of Claim 22, wherein the polyhedral oligosilsesquioxane component comprises 3-(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxane-1-yl)propyl methacrylate; 3-[(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxan-1-

yloxy)dimethylsilyl]propyl methacrylate; 1,3,5,7,9,11,13-heptacyclopentyl-15vinylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxane, or combinations thereof.

25. (Previously Presented) The polymeric chemically amplified resist of Claim 22, wherein the polymer comprises 1% to about 40% by weight the polyhedral oligosilsesquioxane component.

26. (Original) The polymeric chemically amplified resist of Claim 22, wherein the polymeric resist has a glass transition temperature greater than about 165°C.

27. (Original) The polymeric chemically amplified resist of Claim 22, wherein the polymeric resist has a weight-average molecular weight greater than about 100,000 g/mol.

28. (Original) The polymeric chemically amplified resist of Claim 22, wherein the polymer has a polydispersity index between 1 and about 2.

29. (Original) A polymeric chemically amplified resist comprising methyl methacrylate, t-butyl methacrylate, methacrylic acid, and 3-(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxane-1-yl)propyl methacrylate.

30. (Previously Presented) A lithographic process comprising:

exposing a lithographic recording medium to radiation to form a pattern; and

developing the pattern;

wherein the lithographic recording medium comprises the polymeric chemically amplified resist of Claim 22.

31. (Original) The lithographic process of Claim 30, wherein the methacrylate component comprises methyl methacrylate, t-butyl methacrylate, methacrylic acid, or combinations thereof.

32. (Original) The lithographic process of Claim 30, wherein the polyhedral oligosilsesquioxane component comprises 3-(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxane-1-yl)propyl methacrylate; 3-[(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxan-1-yloxy)dimethylsilyl]propyl methacrylate; 1,3,5,7,9,11,13-heptacyclopentyl-15vinylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxane, or combinations thereof.

33. (Original) The lithographic process of Claim 30, wherein the polymeric chemically amplified resist comprises methyl methacrylate, t-butyl methacrylate, methacrylic acid, and 3-(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxane-1-yl)propyl methacrylate.

34. (Original) An integrated circuit prepared by the lithographic process of Claim 30.

35. (Previously Presented) The lithographic process of Claim 30 wherein the radiation comprises an electron beam.

36. (Previously Presented) The lithographic process of Claim 30, wherein the radiation comprises an ion beam.

37. (Previously Presented) The lithographic process of Claim 30, wherein the radiation comprises X-ray radiation.

38. (Previously Presented) A polymeric chemically amplified resist comprising:

a methacrylate component; and

a photoacid generating component.

39. (Original) The polymeric chemically amplified resist of Claim 38, wherein the methacrylate component comprises methyl methacrylate, t-butyl methacrylate, methacrylic acid, or combinations thereof.

40. (Original) The polymeric chemically amplified resist of Claim 38 further comprising a dissolution promoter.

41. (Original) The polymeric chemically amplified resist of Claim 40 wherein the dissolution promoter comprises itaconic anhydride.

42. (Original) The polymeric chemically amplified resist of Claim 38, wherein the photoacid generating component comprises a sulfonium compound, an ionium compound, or combinations thereof.

43. (Original) The polymeric chemically amplified resist of Claim 38, wherein the photoacid generating component comprises [*p*-CH_2=$C(CH_3)C(O)$-$OC_6H_4SMe_2$]OSO_2CF_3.

44. (Original) The polymeric chemically amplified resist of Claim 38, further comprising a polyhedral oligosilsesquioxane component.

45. (Original) The polymeric chemically amplified resist of Claim 44, wherein the polyhedral oligosilsesquioxane component comprises 3-(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.$1^{3,9}$.$1^{5,15}$.$1^{7,13}$]octasiloxane-1-yl)propyl methacrylate; 3-[(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.$1^{3,9}$.$1^{5,15}$.$1^{7,13}$]octasiloxan-1-yloxy)dimethylsilyl]propyl methacrylate; 1,3,5,7,9,11,13-heptacyclopentyl-15vinylpentacyclo-[9.5.1.$1^{3,9}$.$1^{5,15}$.$1^{7,13}$]octasiloxane, or combinations thereof.

46. (Previously Presented) The polymeric chemically amplified resist of Claim 44, wherein the polymer comprises about 1% to about 35% by weight the polyhedral oligosilsesquioxane component.

47. (Original) The polymeric chemically amplified resist of Claim 38, wherein the polymer has a weight-average molecular weight between 20,000 to 100,000 g/mol.

48. (Original) The polymeric chemically amplified resist of Claim 38, wherein the polymer has a polydispersity index between 1 and about 2.

49. (Original) A polymeric chemically amplified resist comprising methyl methacrylate, t-butyl methacrylate, methacrylic acid, 3-(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.$1^{3,9}$.$1^{5,15}$.$1^{7,13}$]octasiloxane-1-yl)propyl methacrylate, and [*p*-CH_2=$C(CH_3)C(O)OC_6H_4SMe_2$]OSO_2CF_3.

50. (Original) The polymeric chemically amplified resist of Claim 49, further comprising itaconic anhydride.

51. (Previously Presented) A lithographic process comprising:

exposing a lithographic recording medium to radiation to form a pattern; and

developing the pattern;

wherein the lithographic recording medium comprises the polymeric chemically amplified resist of Claim 38.

52. (Original) The lithographic process of Claim 51, wherein the methacrylate component comprises methyl methacrylate, t-butyl methacrylate, methacrylic acid, or combinations thereof.

53. (Original) The lithographic process of Claim 51, wherein the polymeric chemically amplified resist further comprises a dissolution promoter.

54. (Original) The lithographic process of Claim 53, wherein the dissolution promoter comprises itaconic anhydride.

55. (Original) The lithographic process of Claim 51, wherein the photoacid generating component comprises a sulfonium compound, an ionium compound, or combinations thereof.

56. (Original) The lithographic process of Claim 51, wherein the polyhedral oligosilsesquioxane component comprises 3-(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.$1^{3,9}$.$1^{5,15}$.$1^{7,13}$]octasiloxane-1-yl)propyl methacrylate; 3-[(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.$1^{3,9}$.$1^{5,15}$.$1^{7,13}$]octasiloxan-1-yloxy)dimethylsilyl]propyl methacrylate; 1,3,5,7,9,11,13-heptacyclopentyl-15vinylpentacyclo-[9.5.1.$1^{3,9}$.$1^{5,15}$.$1^{7,13}$]octasiloxane, or combinations thereof.

57. (Original) An integrated circuit prepared by the lithographic process of Claim 51.

58. (Previously Presented) The lithographic process of Claim 51, wherein the radiation comprises extreme ultraviolet radiation.

59. (Previously Presented) The lithographic process of Claim 51, wherein the radiation comprises X-ray radiation.

60. Canceled

61. Canceled

62. (Currently Amended) ~~The polymeric lithographic resist of Claim 60,~~ A polymeric lithographic resist comprising a photoacid generating component, wherein the photoacid generating component comprises [*p*-CH_2=$C(CH_3)C(O)OC_6H_4SMe_2$]OSO_2CF_3.

63. Canceled

64. Canceled

65. (Original) A polymeric resist comprising:

a polyhedral oligosilsesquioxane disilanol component; and

a polyacetal component.

66. (Original) The polymeric resist of Claim 65, wherein the polyhedral oligosilsesquioxane disilanol component comprises disilanol cyclopentyl POSS ($Si_8O_{11}(c\text{-}C_5H_9)_8(OH)_2$), disilanol isobutyl POSS ($Si_8O_{11}(i\text{-}C_4H_9)_8(OH)_2$), or dimethylphenyldisilanol cyclopentyl POSS ($Si_8O_9(c\text{-}C_5H_9)_7(OSiMe_2Ph)(OH)_2$), or a combination thereof.

67. (Original) The polymeric resist of Claim 65, wherein the polyacetal component comprises a polymer of a halogen-substituted ketone or aldehyde.

68. (Previously Presented) The polymeric resist of Claim 65, wherein the polyacetal component comprises a polymer of hexafluoroacetone, trifluoroacetone, hexachloroacetone, trichloroacetone, trifluoroacetaldehyde, trichloroacetaldehyde, thiocarbonylfluoride, hexafluorothioacetone, mixtures thereof, or derivatives thereof.

69. (Previously Presented) A lithographic process comprising:

exposing a lithographic recording medium to radiation to form a pattern; and

developing the pattern;

wherein the lithographic recording medium comprises the polymeric resist of Claim 65.

70. (Previously Presented) The lithographic process of Claim 69, wherein the lithographic process comprises a 157 nm projection optical lithographic process.

71. (Original) An integrated circuit prepared by the lithographic process of Claim 69.

72. (Currently Amended) A nanocomposite resist comprising:

a nanoparticle component; and

a polymer component;

wherein the nanoparticle component comprises a boride, a carbide, a silicide, a nitride, a phosphide, an arsenide, ~~an oxide other than a polyhedral oligosilsesquioxane,~~ a sulfide, a selenide, a telluride, a fluoride, a chloride, a bromide, an iodide, or any combination thereof.

73. (Currently Amended) A nanocomposite resist comprising:

a nanoparticle component; and

a polymer component;

wherein the polymer component comprises poly(α-chloroacrylate-*co*-α-methyl styrene), poly(2,2,2-trifluoroethyl-α-chloroacrylate), ~~poly(methylmethacrylate),~~ poly(butene sulfone), polyacetals, or combinations thereof.

74. (Previously Presented) The lithographic process of Claim 14, wherein the nanoparticle component comprises a boride, carbide, silicide, nitride, phosphide, arsenide, oxide, sulfide, selenide, telluride, fluoride, chloride, bromide, iodide, or combinations thereof.

75. (Previously Presented) The lithographic process of Claim 14, wherein the polymer component comprises a polymer that undergoes chain scission upon exposure to electron beam irradiation.

76. (Previously Presented) The lithographic process of Claim 14, wherein the nanoparticle component comprises a nanoparticle having an average diameter less than about 100 nanometers.

77. (Previously Presented) The lithographic process of Claim 14, wherein the nanoparticle has an average diameter less than about 10 nanometers.

78. (Previously Presented) The lithographic process of Claim 14, wherein the nanoparticle has an average diameter less than about 2 nanometers.

79. (Currently Amended) The lithographic process of Claim 14, wherein the nanoparticle component comprises a polyhedral oligosilsesquioxane ~~comprises~~ comprising a compound of formula $Si_8O_{12}(OR)_8$, $Si_8O_{12}R_8$, $Si_{12}O_{18}(OR)_{12}$, or $Si_{12}O_{18}R_{12}$, wherein R is selected from alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, silyl, substituted silyl, aryl, substituted aryl, aralkyl, substituted aralkyl, alkenyl, or substituted alkenyl.

80. (Previously Presented) The lithographic process of Claim 14, wherein the polymer component comprises poly(α-chloroacrylate-*co*-α-methyl styrene).

81. (Previously Presented) The lithographic process of Claim 14, wherein the resist comprises from about 1% to about 50% by weight the nanoparticle component .

82. (Previously Presented) The lithographic process of Claim 14, wherein the resist has a glass transition temperature of at least about 160°C.